This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): Locomotive apparatus for supporting and moving a vehicle, toy, or other body, on a support surface, ~~such as a table, board, track, ground, or other surface,~~ including a plurality of legs extending from the body, each leg comprising a leg lever having a proximal end portion connected to a drive mechanism and a distal end portion adapted for contacting and supporting the body on [[a]] the support surface~~, such as a floor, ground, track, board, or other surface~~, wherein the drive mechanism and the leg are characterized by:

[[a]] the proximal end portion of the leg lever~~, which can include all or part of the proximal end portion of the leg or which can be connected to the leg, said leg lever being~~ connected to a crank and constrained at a pivot adjacent the crank to move the distal end portion of the leg lever in a linear path in relation to the body as the crank rotates through a part of a 360-degree revolution and to lift the distal end portion of the leg lever and return it to a starting point of the linear path as the crank completes the 360-degree revolution.

Claim 2 (currently amended): The locomotive apparatus of claim 1, wherein constant angular velocity of the crank produces constant linear velocity of the distal end portion along the linear path.

Claim 3 (currently amended): The locomotive apparatus of claim 1, wherein constant angular velocity of the crank produces constant speed of the distal end portion along the linear path and greater speed of the distal end as it lifts and returns to the starting point.

Claim 4 (original): The locomotive apparatus of claim 1, wherein the crank is connected to a motor that can drive the crank to rotate at a constant forward angular velocity.

Claim 5 (original): The locomotive apparatus of claim 4, wherein the motor can also drive the crank to rotate at variable forward angular velocities as well as at constant and variable reverse angular velocities.

Claim 6 (currently amended): The locomotive apparatus of claim 1, wherein the crank rotates at a radial distance about a crank axis, said crank axis being positioned at a lateral distance from the pivot, and wherein the radial distance and the lateral distance are sized in a proportional relation to each other that produces an angular relationship very close to Q = ATAN (VR/ωd), where R is an angle between a line extending through the crank axis and the pivot and a line extending through the crank axis and the crank, where Q is an angle between the line extending through the crank axis and the crank and a line extending through the pivot and the crank, where ω is the angular velocity of said crank, where V is the linear velocity of the distal end portion, and where d is a distance between the pivot and the linear path on a line that extends through the crank axis and the pivot and intersects the linear path, ~~and where V, ω, and d are variables as defined in the above description of the invention,~~ so that constant angular velocity ω of the crank produces constant linear velocity V of the distal end portion in the linear path.

Claim 7 (original): The locomotive apparatus of claim 6, wherein the leg lever is constrained against lateral movement in relation to the pivot, but is slideable longitudinally in relation to the pivot.

Claim 8 (original): The locomotive apparatus of claim 7, wherein the leg lever is slotted to be slideable with respect to the pivot.

Claim 9 (original): The locomotive apparatus of claim 7, wherein the crank axis is tilted at an angle less than 90-degrees and greater than zero degrees in relation to the support surface.

Claim 10 (original): The locomotive apparatus of claim 9, wherein the leg lever moves in a plane that is perpendicular to the crank axis.

Claim 11 (currently amended): The locomotive apparatus of claim 6, wherein the radial distance and the lateral distance are sized in a proportion to each other that causes the distal end portion to move in the linear path at a constant velocity during about 270 degrees of rotation of the crank.

Claim 12 (original): The locomotive apparatus of claim 11, wherein the vehicle has six legs, three on each side of the body, and wherein the drives for the respective legs are synchronized in a manner that maintains at least two of the legs on each side moving in their respective linear paths at any time.

Claim 13 (original): The locomotive apparatus of claim 11, wherein the vehicle has four legs, two on each side of the body, and wherein drives for the respective legs are synchronized in a manner that maintains at least three of the four legs moving in their respective linear paths at any time.

Claim 14 (original): The locomotive apparatus of claim 13, including two faux legs, one on each side of the body between the other two legs on such side, the faux leg on one side being slightly too long and the faux leg on the other side being slightly too short, and further wherein said faux legs are pivotal rearwardly from vertical, but not forwardly from vertical, so that the longer faux leg drags during forward motion of the other four legs and lifts a side of the body and the two legs on that side of the body during reverse motion of the other four legs.

Claim 15 (original): The locomotive apparatus of claim 6, including a downwardly extending leg strut hinged to the distal end to form a knee hinge, a stabilizer strut hinged to the leg strut below the knee hinge, and a lift strut connected to the knee hinge, said lift strut being connected to a second crank that is synchronized with the first crank to pull the knee hinge inwardly toward the body and thereby raise the knee hinge and leg strut as the first crank drives the distal end back to the start point of the linear path.

Claim 16 (original): The locomotive apparatus of claim 15, wherein the leg lever is slotted to be longitudinally slideable in relation to the crank and is constrained against lateral and longitudinal motion at the pivot.

Claim 17 (original): The locomotive apparatus of claim 1, wherein said distal end is a foot.

Claim 18 (original): The locomotive apparatus of claim 1, including a foot at said distal end.

Claim 19 (original): Apparatus for moving a distal end of a mechanical leg in a cycle comprising a stride stroke to support and propel an object on a support surface and a step stroke following the stride stroke to lift the distal end above the support surface and return it to begin another stride stroke, said apparatus comprising:

means for moving the distal end at a constant velocity during the stride stroke and at accelerating and decelerating velocities during the step stroke; and

means for maintaining movement of the distal end to a substantially straight path in relation to the object during the stride stroke and to an arcuate path in relation to the object and above the support surface during the step stroke.

Claim 20 (original): The apparatus of claim 19, wherein the means for moving the distal end includes crank means connected to the mechanical leg for pivoting the mechanical leg about a pivot axis.

Claim 21 (original): The apparatus of claim 20, wherein the crank means includes a crank pin that rotates at a radial distance about a crank axis, said mechanical leg being connected to said crank pin in a such a manner that rotation of the crank pin about the crank axis causes the mechanical leg to pivot back and forth about the pivot axis.

Claim 22 (original): The apparatus of claim 21, wherein the pivot axis is positioned adjacent the crank means at a distance from the crank axis that is greater than said radial distance.

Claim 23 (original): The apparatus of claim 22, wherein the mechanical leg is configured in a manner that has the distal end positioned farther from the crank axis than the pivot axis is positioned from the crank axis so that there is a stride plane, which extends through the distal end and is parallel to the pivot axis perpendicular to a first straight line that extends through the pivot axis and the crank axis.

Claim 24 (original): The apparatus of claim 23, wherein there is a distance d along said first straight line between the pivot axis and the stride plane.

Claim 25 (original): The apparatus of claim 24, wherein there is a second straight, which is perpendicular to the crank axis and extends through the crank axis and the crank pin, and wherein there is a third straight line, which is perpendicular to the pivot axis and extends through the pivot axis and the crank pin.

Claim 26 (original): The apparatus of claim 25, wherein there is an angle R between the first straight line and the second straight line and an angle Q between the first straight line and the third straight line, and further wherein the angle R and the angle Q both change as the crank pin rotates about the crank axis.

Claim 27 (original): The apparatus of claim 26, wherein the radial distance from the crank axis to the crank pin and the lateral distance between the crank axis and the pivot axis are sized in a

proportional relation to each other that results in a relationship between the angles R and Q, which is modeled based on the angular profile Q = ARCTAN (VR/ωd), a portion of each revolution of the crank where V is said constant velocity of the distal end in said rectilinear path in said stride plane, ω is angular velocity of the crank pin rotating about the crank axis, and d is said distance along said first straight line between the pivot axis and said stride plane.

Claim 28 (original): A method of supporting and propelling an object over a support surface with a plurality of mechanical legs, comprising:

connecting each mechanical leg to a crank pin that is rotatable at a radial distance about a crank axis;

constraining such mechanical leg in a pivotal manner at a pivot axis that is parallel to the crank axis and positioned at a lateral distance from the crank axis, said lateral distance being greater than the radial distance;

sizing the radial distance and the lateral distance to model an angular profile of Q = ARCTAN (VR/ωd) to obtain a constant velocity V of a distal end of said mechanical leg in relation to angular velocity ω of the crank pin rotation about the crank axis for a stride portion of a revolution of the crank pin about the crank axis, where R is an angle between a plane that includes the crank axis and the pivot axis and a plane that includes the crank axis and the crank pin, where Q is an angle between a plane that includes the crank axis and the pivot axis and a plane that includes the crank axis and a point of contact of the mechanical leg on the support surface, and d is a perpendicular distance from the pivot axis to a plane that is parallel to the pivot axis and extends through the point of contact of the mechanical leg on the support surface; and

rotating the crank pin about the crank axis.

Claim 29 (original): The method of claim 28, including constraining the mechanical leg in a manner that maintains the point of contact of the mechanical leg on the support surface in a rectilinear path during the stride portion of a revolution of the crank pin about the crank axis.

Claim 30 (original): The method of claim 29, including lifting the mechanical leg after the stride portion of a revolution of the crank pin about the crank axis and moving it above the support surface during the remainder of the revolution back to a beginning point to start another stride portion of a revolution.